



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

February 02, 2015

STATOIL USA ONSHORE PROPERTIES, INC.
2103 CITYWEST BOULEVARD - SUITE 800
HOUSTON, TX 77042

Re: Permit Modification Approval for API Number 3305733 , Well #: GOODWIN 2-2H

Modify production casing depth

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Statoil USA Onshore Properties Inc. 494505083 Harrison Sardis Salem 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: 2-2 H Well Pad Name: Goodwin 2 Pad

3 Elevation, current ground: 1096 Elevation, proposed post-construction: 1384

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale is the proposed target formation at a TVD of 7760 ft, a thickness of 58 ft, and a reservoir pressure of 3800 psi, *Intermediate Casing MASP 2300 psi

7) Proposed Total Vertical Depth: 7680 ft

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 16,300 ft

10) Approximate Fresh Water Strata Depths: 45 ft & 645'

11) Method to Determine Fresh Water Depth: Offset wells & 1980 study "Freshwater & Saline Groundwater of WV" by James Foster

12) Approximate Saltwater Depths: 1900 ft

13) Approximate Coal Seam Depths: 803 ft

14) Approximate Depth to Possible Void (coal mine, karst, other): N/A

15) Does land contain coal seams tributary or adjacent to, active mine? No

16) Describe proposed well work: Drill and set new casings using API cement in a horizontal well in the Marcellus Formation.
Complete the well in the Marcellus formation in order for Statoil to produce natural gas.

Received

17) Describe fracturing/stimulating methods in detail:
Perforate and fracture 24 separate stages utilizing 8,800,000 gal of water and 9,100,000 lbs of sand.

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18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 12.71
Office of Oil and Gas
WV Dept. of Environmental Protection

19) Area to be disturbed for well pad only, less access road (acres): 5.48

20)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill -up (Cu. Ft.)</u>
Conductor	20	New	H-40	94#	100'	100'	grouted to surface 120 cu ft
Fresh Water	13 3/8	New	J-55	54.5#	750'	750'	Cement to surface 738 cu ft
Coal							
Intermediate	9 5/8	New	J-55	36#	2660'	2660'	Cement to surface 1099 cu ft
Production	5 1/2	New	P-110	20#	16,300'	16,300'	Cement top @ 1645' 3729 cu ft
Tubing							
Liners							

*MJD
2/2/15*

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20	26	0.438"	1530 psi	Class A	1.3 cu ft/sk
Fresh Water	13 3/8	17 1/2	0.380"	2730 psi	Class A	2.31 cu ft/sk
Coal						
Intermediate	9 5/8	12 1/4	0.352"	3520 psi*	Class A	2.31 cu ft/sk
Production	5 1/2	8 1/2	0.361"	12,640 psi	Class A	1.37 cu ft/sk
Tubing						
Liners						

PACKERS

Kind:				Received
Sizes:				
Depths Set:				JAN 26 2015

21) Describe centralizer placement for each casing string. Surface - 1 centralizer w/stop collar 10' above float shoe. One Single Bow every joint to 100' below surface.
Intermediate - 1 centek centralizer w/stop collar 10' above float shoe, 1 centek centralizer w/stop collar 10' above float collar. 1 centralizer every joint for the first 15 joints. One centralizer every 3 joints to 100' below surface.
Production - 1 centek centralizer w/stop collar 10' above shoe. 1 centek centralizer 10' above float collar. 1 centek centralizer every joint (floating) until KOP. 1 centek centralizer every 3 joints (floating) until 200' inside intermediate shoe. 1 centek centralizer 50' below mandrel hanger.

22) Describe all cement additives associated with each cement type. _____
13 3/8" - Class A with 3% Calcium Chloride
9 5/8": BondCem - Class A, 0.05% retarder, 0.25% defoamer, 1% accelerator, 0.25% dispersant, 0.65% retarder, fresh water
5 1/2": Shale Cem - Class A, 10% dispersant, 0.6% fluid loss, 0.4% cement retarder, 0.1% free water control agent 0.25% defoamer, 0.1% fluid loss, fresh water

23) Proposed borehole conditioning procedures. The surface section will be drilled with fresh water. At casing point, prior to tripping to surface, the hole will be circulated clean approximately three hole volumes while rotating the pipe to clean the hole of cuttings. A water based gel spacer will be pumped prior to pumping the cement in order to further clean the annulus and increase the likelihood of a successful cement job.
The intermediate section will be drilled with 5% KCL WBM. At casing point, prior to tripping to surface, the hole will be circulated clean approximately three hole volumes while rotating the pipe to clean the hole of cuttings. A water based gel spacer will be pumped prior to pumping cement in order to further clean the annulus and increase and increase the likelihood of a successful cement job. The curve and lateral section will be drilled with a +13.0 lb/gal synthetic based mud. If an excessive amount of sliding is required to control inclination, slides will be performed in short intervals to eliminate a dune of cuttings behind the BHA. Pump rates will be maintained between 450-600 gal/min. Once TD is reached, a clean-up cycle will performed. Bottoms up will be pumped three times or until returns are clean of cuttings. A 50-60 bbl spacer will be pumped prior to the cement in order to prevent contamination.

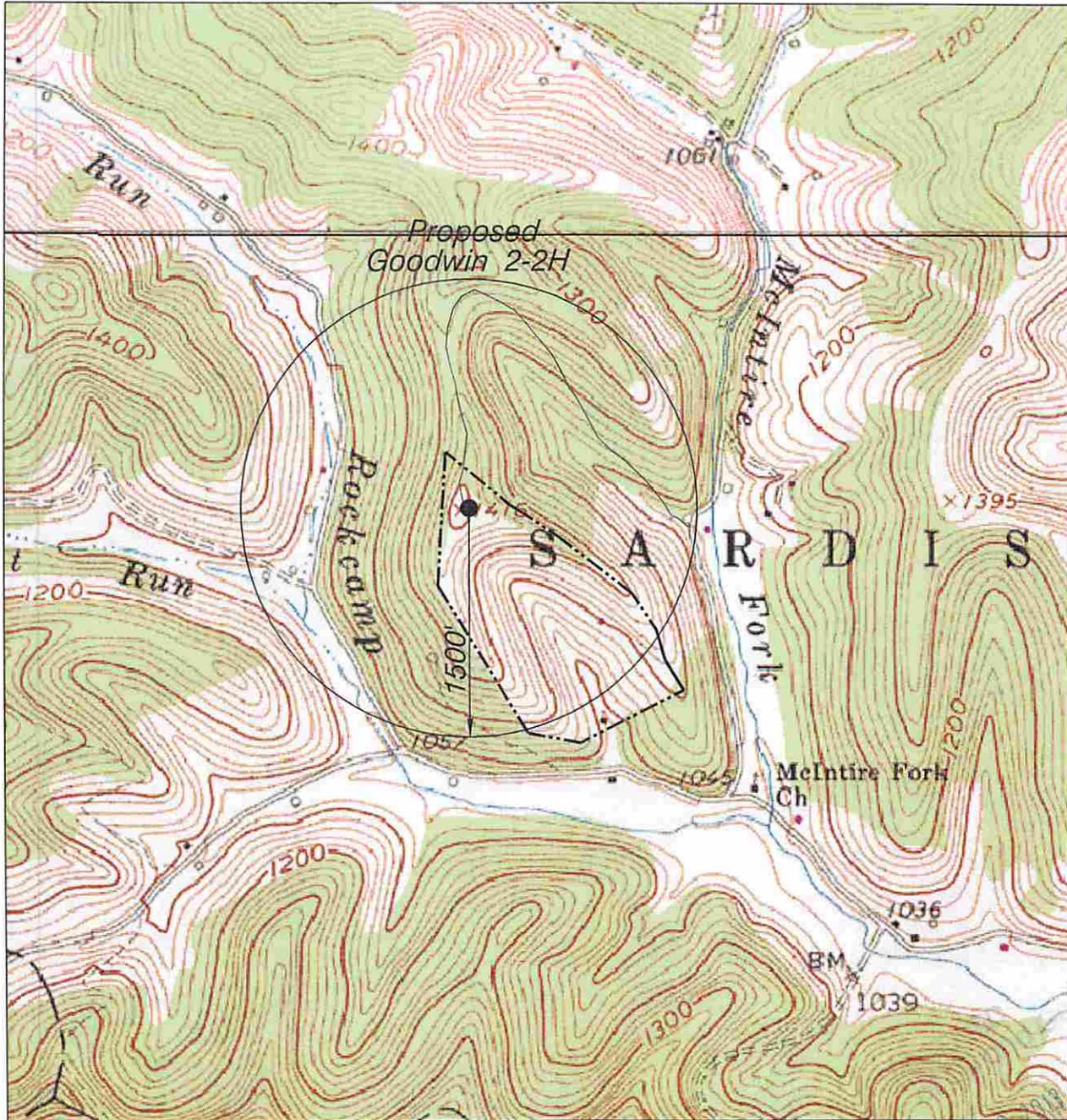
*Note: Attach additional sheets as needed.

Received

JAN 26 2015

Office of Oil and Gas
WV Dept. of Environmental Protection

STATOIL USA ONSHORE PROPERTIES INC. GOODWIN 2-2H WATER



NORTH

HUPP Surveying & Mapping

P.O. BOX 647 GRANTSVILLE, WV 26147

PH:(304)354-7035 E-MAIL: hupp@frontiernet.net

1" = 1000'

Salem Quad

STATOIL USA ONSHORE PROPERTIES INC.

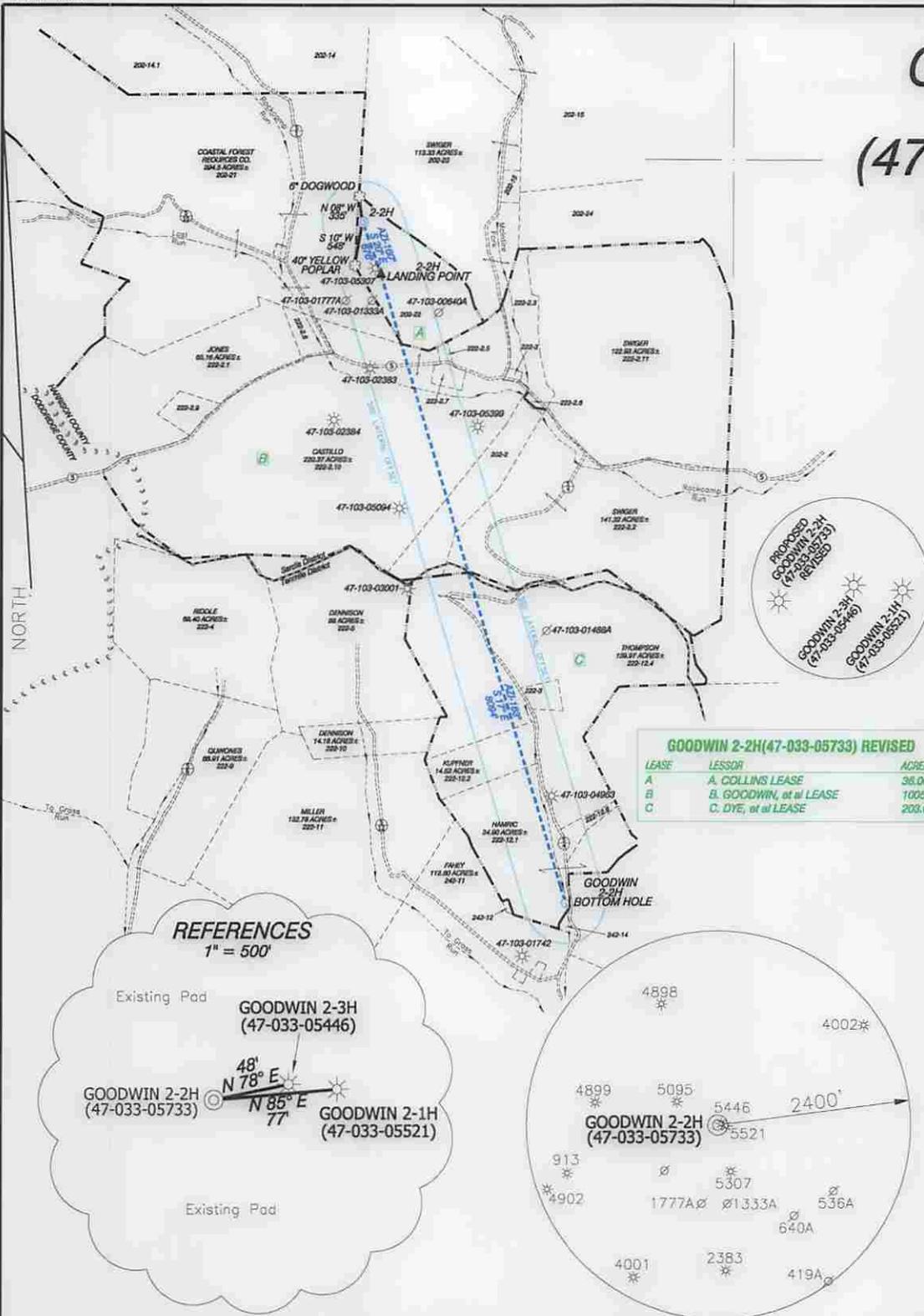
2103 CITYWEST BLVD. SUITE 800

HOUSTON, TX 77042

Original Department of
FEB 13 2011
Production

GOODWIN 2-2H (47-033-05733) REVISED

LONGITUDE 80°30'00"
LAT. 39°22'11.9" 1,895'



GOODWIN 2-2H SURFACE HOLE	
STATE PLANE COORDINATES	L & L DECIMAL
NORTH ZONE -NAD 27	NAD 27
(N) 318511	39.369984
(E) 1710875	80.522696
UTM (NAD 27)	UTM (NAD 83)
ZONE 17	ZONE 17
US FEET	METERS
14297003	436795.4
1775310	541130

GOODWIN 2-2H LANDING POINT	
STATE PLANE COORDINATES	L & L DECIMAL
NORTH ZONE -NAD 27	NAD 27
(N) 317874	39.368842
(E) 1711103	80.521866
UTM (NAD 27)	UTM (NAD 83)
ZONE 17	ZONE 17
US FEET	METERS
14296370	436778.1
1775548	541203

GOODWIN 2-2H BOTTOM HOLE	
STATE PLANE COORDINATES	L & L DECIMAL
NORTH ZONE -NAD 27	NAD 27
(N) 310120	39.347025
(E) 1713422	80.513354
UTM (NAD 27)	UTM (NAD 83)
ZONE 17	ZONE 17
US FEET	METERS
14288658	435541.0
1777995	541949

GOODWIN 2-2H(47-033-05733) REVISED		
LEASE	LESSOR	ACREAGE
A	A. COLLINS LEASE	36.00±
B	B. GOODWIN, et al LEASE	1005.00±
C	C. DYE, et al LEASE	203.00±

LINE LEGEND	
LEASE BOUNDARY	---
SURFACE BOUNDARY	----
CREEK/STREAM	~ ~ ~ ~
ROADS	==
PROPOSED LATERAL	----
500' LATERAL OFFSET	----
COUNTY LINE	-----
DISTRICT LINE	-----

REFERENCES
1" = 500'

NOTES ON SURVEY

- NO DWELLINGS WITHIN 625' WERE FOUND.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD '27.
- WELL LAT./LONG. ESTABLISHED BY SC-GPS(OPUS).
- SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF WETZEL COUNTY IN FEBRUARY, 2014 AND INFORMATION PROVIDED BY PETROEDGE ENERGY LLC.
- WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 834

Doyle Hupp Jr.

HUPP Surveying & Mapping
P.O. Box 647 Grantsville, WV 26147
(304) 354-7035 EMAIL: hupp@frontiernet.net



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

DATE JULY 16, 2014

OPERATORS WELL NO. GOODWIN 2-2H REVISED

API NO. 47-033-05733
STATE COUNTY PERMIT

HGA MOD

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. W1977 (BK44-39)
PROVEN SOURCE OF ELEVATION SG-GPS (OPUS) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS



WELL TYPE : OIL ___ GAS LIQUID WASTE IF
INJECTION DISPOSAL "GAS" PRODUCTION STORAGE ___ DEEP SHALLOW

LOCATION : ELEVATION 1390' WATERSHED ROCKCAMP RUN
DISTRICT SARDIS COUNTY HARRISON QUADRANGLE SALEM 7.5'

SURFACE OWNER THOMAS & VANESSA COLLINS ACREAGE 35.5±
ROYALTY OWNER THOMAS & VANESSA COLLINS, et al LEASE ACREAGE 369.80±

PROPOSED WORK : LEASE NO. _____
DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD
FORMATION ___ PERFORATE NEW FORMATION ___ PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___ OTHER ___
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD- 7680' MD- 16,300'

WELL OPERATOR STATOIL USA ONSHORE PROPERTIES INC. DESIGNATED AGENT RICHARD PYLES
ADDRESS 2103 CITYWEST BLVD., SUITE 800, HOUSTON, TX 77042 ADDRESS 803 NASH ROAD MIDDLEBOURNE, WV 26149

COUNTY NAME PERMIT